

CLAIMS

1. A membrane electrode assembly for a proton-exchange membrane fuel cell, comprising a polymer electrolyte membrane and an electrode catalyst layer,
 - 5 wherein at least a part of the polymer electrolyte membrane infiltrates into the electrode catalyst layer, and
 - wherein the polymer electrolyte membrane is formed by polymerizing a composition containing at
 - 10 least a compound having proton conductivity and a compound having activity to an active energy ray, or a composition containing at least a compound having proton conductivity and activity to the active energy ray.
- 15 2. A membrane electrode assembly according to claim 1, wherein a reinforcement member composed of an electrical insulator is provided inside the polymer electrolyte membrane.
3. A production method for a membrane electrode assembly for a proton-exchange membrane fuel cell, the assembly comprising a polymer electrolyte membrane and an electrode catalyst layer, at least a part of the polymer electrolyte membrane infiltrating into the electrode catalyst layer, the production
 - 20 method comprising the steps of:
 - coating the electrode catalyst layer with a composition containing at least a compound having
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proton conductivity and a compound having activity to an active energy ray, or a composition containing at least a compound having proton conductivity and activity to the active energy ray, to form a

5 precursor layer of the polymer electrolyte membrane composed of the composition, at least a part of the composition infiltrating into the electrode catalyst layer; and

polymerizing the composition by irradiating the

10 precursor layer with the active energy ray, to form a polymer electrolyte membrane at least a part of which infiltrates into the electrode catalyst layer.

4. A production method for a membrane electrode assembly according to claim 3, wherein the electrode

15 catalyst layer has a thickness of 0.01 to 200 μm , and an infiltration amount of the composition into the electrode catalyst layer is equal to or smaller than the thickness of the electrode catalyst layer.

5. A production method for a membrane electrode

20 assembly according to claim 3, wherein the composition is coated after a reinforcement member composed of an electrical insulator is provided on the electrode catalyst layer.

6. A proton-exchange membrane fuel cell

25 comprising a membrane electrode assembly for a proton-exchange membrane fuel cell, the membrane electrode assembly comprising a polymer electrolyte

membrane and an electrode catalyst layer,
wherein at least a part of the polymer
electrolyte membrane infiltrates into the electrode
catalyst layer, and

- 5 wherein the polymer electrolyte membrane is
 formed by polymerizing a composition containing at
 least a compound having proton conductivity and a
 compound having activity to an active energy, or a
 composition containing at least a compound having
10 proton conductivity and activity to the active energy
 ray.